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Vol. 2 March No. 1

The EXTENSION ENTOMOLOGIST

Now that 1937 with its trials and tribulations is history, let us take stock to see where we stand. What improvements can we make in 1938? How can we more effectively carry on our work of better insect control, reach more people, and stimulate them to a more profitable living? Mr. George W. Gray in the Advancing Front of Science states under "A Fundamental Need," "One of the imperative tasks of our day is to interpret the purposes, methods, and results of science in such wise that this greatest adventure of the human spirit may be "understanded of the people." Science needs to be made use of, but understanding of it must precede complete utilization." The program of the Extension Section at the Indianapolis meeting was built around this thought.

M. P. Jones

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Extension Entomologist

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND
EXTENSION SERVICE, COOPERATING

209-38

Contents

INTRODUCTION

The Extension Entomologist was originally intended as a house organ for the extension specialists in entomology. So many requests have come in from other entomologists and libraries that the list was necessarily expanded. It now includes those people who are most likely to be interested in the contents of this circular. If this publication serves no particular purpose, please let us know and your name will be removed from the mailing list.

PERSONNEL

Iowa. Mr. A. D. Worthington has resigned as extension entomologist, effective March 1. Mr. Worthington plans to return to Mississippi to take charge of his large plantation of many hundred acres. This change is due to the fact that Mr. Worthington's brother, who had charge of the plantation, died last spring.

Missouri. Mr. Herbert L. Koch has been appointed assistant to Mr. George Jones for this year in the grasshopper-control work. Mr. Koch still carries the title of assistant county agent, but he is interested in entomological work and has a Master's degree from the Department of Entomology.

Nebraska. Mr. Dean Eckhoff has been appointed assistant extension entomologist effective February 1, 1938. This is a temporary appointment.

Oklahoma. Mr. J. Myron Maxwell was appointed assistant extension entomologist January 1, 1938.

U. S. D. A. Mr. A. B. Graham, In Charge, Subject-Matter Specialists, is due to retire March 31. Mr. H. W. Hochbaum, In Charge, Eastern Section, has been selected to succeed Mr. Graham.

Mr. C. P. Close, senior extension horticulturist, was retired January 31. Mr. Close is known to most of you through his work and through his visits to the States.

SOURCES OF MATERIAL

Mr. A. B. Graham has been my mentor for several years, and since many of you have been denied the privilege of the close association with him that I have enjoyed, he has graciously consented to prepare a short paper on "Know men, know bugs." In this article, Mr. Graham can do no more than scratch the surface of a subject as broad as this one. Human nature has not changed so much since the days of Plato and Aristotle, consequently we cannot afford to disregard the counsel of the philosophers of today.

The Division of Domestic Plant Quarantines of the Bureau of Entomology and Plant Quarantine is dealing with people. Mr. Gaddis, in charge of this

division, appreciates the need for winning the favor of the public in general. He desires to cooperate with all agencies that make contacts with the public, and has submitted available information relative to progress in the control campaign of the white-fringed beetle.

As a third special article, I am giving a brief report of the Indianapolis meeting for the benefit of those who did not attend. The program is being included again in this issue for your information. It follows the report. Mr. McCampbell, Mr. Decker, Mr. Flint, Mr. Reppert, Professor Hodgkiss, and Mr. Nettles were unable to be present, but some of them submitted papers which were presented and discussed by other entomologists in attendance.

SPECIAL ARTICLES

Know Bugs--Know Men

In order that the injurious bug may be killed, we endeavor to get acquainted with him, his anatomy, and physiology; the foods he likes; his ability to adapt himself to new foods; how heat and cold, drought and water affect him; the effects of barriers or obstructions; the odors that attract or repel him; what other bugs like to eat him; what other insects would lay an egg within him; what birds would consider him a sweet morsel; and many other things about him that might aid man to suffocate him, poison him, or otherwise lessen the bug population.

At the science meetings in Indianapolis the extension entomologists discussed ways and means of helping man to know the behavior of the bug in order that he might control it. Man himself was also discussed as to how he can be brought to a full realization of the annoyance of Mr. Bug. This subject engaged the serious attention of the extension worker, and the discussions of the use of various teaching implements gave manifestations of a knowledge of man's characteristics. If we analyze some of his characteristics, among the important ones will be found the following which ran through the discussions unlabeled.

Curiosity. This characteristic may be used in putting up extension material so that the learner will be curious to acquire manipulatory skills, curious to see concealed exhibits, inquire where material can be secured, and delve into the cost of application.

Inventiveness. The extension worker's material should be presented in such a way that it challenges the inventiveness of the learner to make modifications, to adapt himself to the use of implements, to participate in the work with the teacher in learning the control of insects.

Another characteristic, and a strong one, is acquisitiveness, the desire to develop a good orchard, the inclination to possess a well-landscaped yard, to produce marketable grain, fruits, and vegetables free from insect blemishes.

Imitation is a very strong characteristic. Man, being a group-loving animal, wants to do what those worthy of imitation do successfully so he may use insect-control methods because people worthy of following are also using them.

He is by nature altruistic in that he wants to help others or to let others learn from his procedure, if he is successful. Every man has more or less of the missionary spirit. He likes to have his garden, field, or animals used for demonstration purposes. It is not his altruism alone, but, to some degree, his egoism. He desires to be recognized--who doesn't? One should never forget that the successes of the learner should be approved. Success begets success.

Man must be appealed to from at least four outstanding points of view:

1. Economic appeal. He will save money or labor or time.

2. Appeal for preservation of self or offspring. Securing an ample and wholesome supply of food, the prevention of disease and its transmission by insects, in part.

3. An appeal to his tendency to imitate others who are worthy because of successful practices.

4. Egoistic appeal. The building up of pride in his own accomplishments, especially the appearance of his orchard, crops, animals, or the shrubbery about his residence.

A knowledge of these principal characteristics of man makes a salesman better able to serve a customer. It enables the social worker to help people live more harmoniously in a community. The successful teacher knows all these various characteristics and, more particularly, has sympathy or understanding of the conditions in which the person lives.

Every individual who has to do with adjusting human beings to each other or to their environment works, either consciously or unconsciously, on these particular mental characteristics. The shoveler of information, who simply knows bugs, may not succeed as a teacher who knows men. The real teacher, whether in the extension field or elsewhere, knows both bugs and men.

White-Fringed Beetle

White-fringed beetle, Naupactus leucoloma Boh., was first observed in the United States in the summer of 1936 in Okaloosa and Walton Counties, Fla., and Covington County, Ala., where it was found to feed upon a wide range of agricultural crops, especially peanuts, cotton, and corn. In the summer of 1937 Federal and State entomologists found considerable spread, and increased damage had taken place. On July 21, 1937, funds were made

available from the appropriation for the control of emergency outbreaks of insects pests and plant diseases and also from the infested States, and control operations were begun with headquarters at Florala, Ala. A corps of Federal and State inspectors scouted the ports and other cities in 55 counties of six States and located infestations at Laurel, Miss., Pensacola, Fla., New Orleans, La., and also an infestation of Naupactus species apparently of equal economic importance in the Mississippi towns of Gulfport, Saucier, Landon, and McHenry. A total 15,726 acres have been found infested to date.

Control and regulatory measures

Approximately 150 miles of outside barrier ditches were established around the infested areas in the vicinity of Florala, and over 300 miles of barrier furrows around infested fields. These barriers, with post holes at frequent intervals, proved effective in trapping quantities of the insect and retarding migration. Quarantines established by the States of Alabama, Florida, and Mississippi were put into effect under which farm produce, forest products, and farm effects were inspected before being moved from the infested area. Cotton gins, cotton-oil mills, and peanut shellers were operated under inspectors' supervision. Thorough clean-up measures were effected on properties in the infested areas in cooperation with public health officials, industrial organizations, State pest-control officials, and county agents. During the present winter, a detailed crop survey has been made of 10,000 acres in the infested area with classifications as to produce and woodlands.

Plans for 1938 work

In addition to the maintenance of barriers to prevent adult beetles from migrating to noninfested areas and the enforcement of quarantines, the 1938 work will include such control measures as the removal of weeds and other host plants from abandoned and waste areas, the use of arsenicals to poison adult beetles, and the adoption of cultural practices in planted areas such as elimination of favored host plants, clean culture throughout the season to eliminate favored weedhost plants, and the maintenance of barrier furrows between rows to trap adults and prevent migration from such fields.

As soon as adult beetles have emerged it is planned to carry on an intensive survey to determine possible existence of the white-fringed beetle outside known infested areas. The services of extension entomologists and county agents will be especially valuable in this phase of the program, and plans to secure special cooperation of those in Southern States are now being formulated for consideration at meetings to be held in the field.

Report of the Extension Section
of the Indianapolis Meeting

At this meeting Mr. T. H. Parks served as chairman and Mr. L. H. Shropshire as secretary. I think the program was one of the best we have

had, and I heard similar expressions from other people who attended our section. Space will not permit a report of all of the discussions, and only the high lights will be mentioned here. It is the plan, I believe, to print all of the papers together in the Journal of Economic Entomology.

Mr. T. H. Parks of Ohio led the discussion on the first phase, commercial and agricultural. It was brought out that some individuals have used various commercial agencies, such as the dealers in insecticides, and lumber dealers, in reaching people who would not be reached through our extension channels. Another point of interest was that through close cooperation some of the extension entomologists were able to get dealers to use their recommendations. Mr. Parks stated that each year a certain group of insecticide manufacturers met with the entomologists and based their sales program on the recommendations of the Ohio Spray Service. It was also brought out that some of the extension entomologists are correlating their work with various other agricultural agencies. I feel certain there is a gradual tendency toward cooperation along this line.

With reference to the press, Mr. Dibble of Michigan led this discussion. He told how he had used the Michigan Farmer to get timely information to the farmers. He writes the "store box" type of article under the name of "Bill Bugs." He is adept at this kind of writing, and he reaches many people through these articles who would not read a technical article. Other entomologists told how they had used farm papers and daily newspapers to reach more people.

Dr. R. W. Leiby of New York State led the discussion on bulletins and circulars. He expressed the feeling that bulletins and circulars had a very definite place in extension work, and he thought they applied particularly to the better class of farmers who wanted detailed information. Circulars, both printed and mimeographed, it was thought, were desirable also for the less experienced grower who merely wanted to know what to do under the existing circumstances. Since recommendations on insect control vary from year to year, New York prints only sufficient copies of their bulletins to last throughout the one season. All old copies are collected from the commercial people and up-to-date editions distributed in their place.

In the same discussion, George Jones of Missouri referred to the bimonthly news notes he prepares for county agents. These notes contain stories about insects. He writes the stories especially for county agents' use, since he realizes that in the rush of other agricultural work they are unable to review literature and prepare their own stories. Various other entomologists commented on this and told of the various types of bug flashes, news letters, and other circulars they were preparing for the same reason.

The discussion on radio was led by Mr. Parten of Minnesota. He felt that it had little place in the extension program. I think his negative attitude aroused more discussion than had he reported favorably as many entomologists rose in defense of this type of reaching more people. They told how they had used the radio to good advantage. Mr. Dibble thought that if the agricultural programs were well arranged, farm people would form the

habit of listening to them as quickly as they turn on the various commercial programs. But it takes more than simply getting up and giving a dry subject-matter talk. It was believed that timely information such as that used in the spray service in some States could be handled exceptionally well over the radio.

Mr. Lehker, of Indiana, led the discussion on visual instruction. He demonstrated very clearly how visual aids can be used to further our extension programs. First he used a crayon to demonstrate some of the points in termite control. Then he brought out rather large models of insects. One had bags of money strapped on its back, the other insect was without the money bags. The insect without the money bags represented the fact that entomologists and farmers are aware of the existence of insects, but the farmers don't realize that the bugs are actually taking dollars from their incomes, as represented by the insect with the money bags. He also had a number of figures to show the value of spraying, and to further emphasize the necessity of repeated applications of sprays to fruit he took a small white toy balloon, partially inflated it, and then sprayed it. After further inflating it, the spray seemed to separate. This certainly helped one to visualize the exposed portions of the apple that needed to be covered.

In the absence of Mr. Nettles of South Carolina, the discussion on demonstrations was handled by Prof. Dean of Kansas, who told how Doctor Kelly had used demonstrations to good advantage in furthering his work. He resorts quite frequently to the team demonstration method. Mr. Gilbertson of South Dakota told how he had trained 4-H club members to help him demonstrate the method of mixing and spreading grasshopper bait. There is great demand for these boys, and others are being trained to further help him in his grasshopper program. Mr. Whittington of Ohio told how he had used a field demonstration in the control of an armyworm outbreak. Each of these entomologists emphasized the necessity for adequately advertising the time and place of the demonstrations and the need for farmer participation.

I was assigned the topic "Can we adopt uniform methods for measuring results in entomological practice?" I first wrote to the extension entomologists to get their reaction to this question, and the general opinion was that we cannot adopt uniform methods. However, I cited examples of how various workers had measured their results, and stated that in order that our superiors may justify our existence to the farm public we must devise some means of measuring the results of our work. This paper is to be published in the Journal of Economic Entomology.

The entire group was very much pleased to have Mr. A. B. Graham present to show us how we need to take into account the farmers themselves, their attitudes and their desires, in furthering our extension program. He used points brought out in the discussion to illustrate what he wished to emphasize.

After about 3 hours' discussion we adjourned, first having elected the following officers for next year: Dr. W. E. Blauvelt, assistant extension entomologist, Cornell University, Ithaca, N. Y., chairman; W. C. Nettles, extension entomologist, Clemson College, South Carolina, secretary.

Program

SECTION OF EXTENSION
AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS

Indianapolis, Indiana
December 28-30, 1937

T. H. Parks, Chairman

Symposium: Agencies for extending entomological information

1. Commercial and agricultural ..... (T. H. Parks
(S. C. McCampbell

2. Press ..... (C. B. Dibble
(G. C. Decker

3. Bulletins and circulars ..... (R. W. Leiby
(George D. Jones

4. Radio ..... (W. P. Flint
(H. L. Parten

5. Visual instruction ..... (G. E. Lehker
(R. R. Reppert
(H. E. Hodgkiss

6. Demonstrations ..... (W. C. Nettles

7. Can we adopt uniform methods for measuring results in entomological practice? ..... (M. P. Jones

Election of officers

Adjournment

TIMELY TOPICS

1937 Science Progress

Science Service, reviewing 1937 progress in biological sciences, medical sciences, engineering and technology, chemistry and physics, psychology and psychiatry and earth sciences, lists, among many, the following few: heartbeats of insects were recorded with a new mechanism; flowers were induced to form fruit with pollination, through spraying with growth-promoting substances; major outbreaks of grasshoppers and Mormon crickets occurred in the West, and autumn studies of egg deposits indicated probability of similar outbreaks next year; a so-called elixir of sulfanilamide caused over 80 deaths by poisoning from diethylene glycol used as a solvent in the remedy; the white-fringed beetle, a new insect menace, was found in three Southern States and brought under control; the migratory bird treaty with Mexico was ratified; a new organization, the Wildlife Society, was formed to promote the protection and restoration of native species; a method of sterilizing wool fabrics without injury was perfected; the earth's age was checked by studies of radio-active potassium and the figures agreed closely with those found from studies of uranium; record-breaking floods visited the Mississippi, Ohio, and Connecticut valleys during 1937, causing great property damage and accelerating flood-control work.

Human Resources

America's human resources are disappearing four times as rapidly as her soil resources are being depleted by dust storms, crop removal, and erosion, Dr. O. E. Baker, agricultural economist of the United States Department of Agriculture, told the International Congress on Population. Famine of agricultural products is not likely to be a danger in the United States, Dr. Baker indicated. "From the standpoint of agricultural prosperity, we have too much land in the United States and too few people," he declared. Despite the large losses in soil depletion, amounting to about 5 percent a decade, the rapidly declining birthrate which has fallen as much as 20 percent in the same length of time makes a shortage of food most unlikely, Dr. Baker indicated. If present trends are not greatly altered, the population will increase only about 8,000,000 in the next 20 years, by which time the maximum will have been reached.

Schools for Cooperators

In October the Cooperative League Institute, a "college for prospective cooperative executives," opened in New York City, with 20 students from 13 States and one foreign country. This is the first national training school for the American consumers' cooperative movement. In October the Central Cooperative Wholesale Society's resident training school also opened its thirteenth session at Superior, Wis. Antioch College, Ohio, and the Ohio Farm Bureau are collaborating to give two courses in cooperation this year, an introductory course and an advanced course in consumer economics.

Preserve Insect in Shell

Precious amber, prized by mankind as a gem and by the scientist for the remains of long-extinct insects preserved in it, has a modern rival in a new technique for preserving insects in transparent plastic materials, says a Science Service report. Details of a process for putting insects inside a preserving shell of synthetic resin are independently reported by Dr. J. H. Hibben of the Geophysical Laboratory, Carnegie Institution of Washington, and Dr. Charles E. Sando of the United States Department of Agriculture. Using compounds such as methyl methacrylate, the two scientists have succeeded in protecting the insects from the ravages of daily moisture changes which damaged unmounted specimens. Drs. Hibben and Sando have succeeded in mounting insects, dry plant materials, and a host of inorganic substances in plastic shells. Using other methods, G. R. Fessenden, of the Department of Agriculture, has worked out means for "fixing" the colors and shapes of growing plants, so that they too may be mounted in plastic shells. Leaves and flowers, just as they come from the field, can be mounted to protect them from damage and preserved in a "fresh" state indefinitely.

Colored Insecticides

"That the color of the insecticide used may have a definite effect upon the number of insects attracted to the host plant has been demonstrated in tests made at the New York (Geneva) Experiment Station and reported upon recently by J. B. Moore," says Scientific American (February). "The experiments were carried on with aphids on potatoes because it had been observed that aphids tend to increase in numbers on plants sprayed with bordeaux, explained Mr. Moore. By the aid of delicate instruments it was possible to test the light responses of aphids to sprayed and unsprayed potato leaves. From the results obtained it has been concluded that the aphids are attracted to the sprayed plants because of the increased intensity of light reflected from the sprayed surfaces. Extending his studies to aphids on cabbage, Mr. Moore found that the infestation on plants dusted with a lead arsenate lime mixture could be reduced below that on untreated plants by dyeing the dusts used. Black dust was the most effective in reducing the infestation. It is believed that the results obtained in these experiments might well lead to modifications of present spraying and dusting practices on crops infested with aphids by using dyed materials to insure a reduction in the light intensity reflected from the treated surfaces."

Nicotine Bentonite Protected as an Insecticide

Claude R. Smith has been granted U. S. Patent 2096566, which covers the use of nicotine bentonite as a stomach poison for insects. Although nicotine has been used with bentonite by entomologists for sometime, Mr. Smith was the first to show that the nicotine and bentonite combine to form a definite compound. Heretofore it has been assumed that the nicotine was adsorbed by the bentonite just as it is adsorbed by fuller's earth. The reaction between bentonite and nicotine is one of base exchange, similar to that which occurs when a hard water is passed through a zeolite water softener.

Possible Toxicity of Rotenone Insect Dust

To the Editor: Please advise as to the toxicity danger in the use of Rotenone Insect Dust by Hammond's on vegetables, beans, cabbage, and cucumbers.

H. H. Rittenhouse, M. D., Bridgeville, Pa.

Answer.--Rotenone itself is seldom used as an insecticide, but rather the powdered crude root of cube or derris (containing rotenone, deguelin, toxicarol, and tephrosin as the principal active constituents). As judged from animal (and to some extent, human) experimentation there is no danger of acute poisoning as a result of ingestion of vegetables sprayed with rotenone, cube, or derris. In this connection it has been estimated that allowing for a maximum spray deposit and assuming that man is no more resistant than the most susceptible of the laboratory animals, a person would have to eat about 4,000 apples sprayed with derris to obtain an acutely fatal dose. The problem of a possible chronic intoxication following the prolonged use of vegetables treated with derris or rotenone has been studied on animals and, while further work is desirable, results of these observations also lead one to believe that the human health hazard here is also low.

References:

Haag, H. B.: Toxicological Studies of Derris Elliptica and Its Constituents, J. Pharmacol. & Exper. Therap. 43: 193. September 1931.

Ambrose, A. M., and Haag, H. B.: Toxicological Study of Derris, Indust. & Engin. Chem. 28:815. July 1936.

Mathews, J. A., and Lightbody, H. D.: Toxicity of Derris and Cube, ibid. 28:812. July 1936.

Ambrose, A. M., and Haag, H. B., Toxicological Studies of Derris, 29:429. April 1937.

Haag, H. B.: Toxicity of Rotenone, Soap 13:137. 1937.

From: Jour. Am. Med. Assn. November 27, 1937. Vol. 109, No. 22, p. 1836.

In the first issue of The Extension Entomologist on page 15, was an abstract of the article "Toxicity of rotenone and derris." There were not enough requests to warrant reproducing the entire article, consisting of about 1,800 words, but for your information, it was printed in the January 1937 issue of Soap. It is probable that your library has a copy of this publication.

Rotenone-containing Dust Mixtures and Sprays Give Good Control of Mexican Bean Beetle

In summarizing the results of insecticide tests performed against the Mexican bean beetle in 1936 on Fordhook Lima beans, L. W. Brannon, of the Norfolk, Va., laboratory, reports that the best control was obtained with dust mixtures of derris-sulphur and cube-sulphur, each containing 0.5

percent rotenone. Derris-wettable sulphur and cube-wettable sulphur sprays (each containing 0.01 percent rotenone) also gave good control of the insect. The percentage of control with the dust mixtures was slightly superior to that obtained with the sprays. Sprays containing 3 pounds of cryolite to 50 gallons of water gave poor control of the bean beetle, as did also a dust mixture containing 60 parts of cryolite and 40 parts of sulphur by weight. The cryolite spray, however, gave slightly better protection against the bean beetle than did the dust mixture.

Relative Efficiency of Various Sprays Against Mexican Bean Beetle in Irrigated Fields

R. L. Wallis, of the Grand Junction, Colo., laboratory, reports that the results of field-control experiments performed against Epilachna varivestis Muls., the Mexican bean beetle, during 1936 on beans grown under irrigation revealed that a derris spray suspension containing 0.015 percent rotenone is as effective against the Mexican bean beetle as a derris spray containing 0.02 percent rotenone. Sprays containing 3 pounds of cryolite to 50 gallons of water, or derris containing 0.015 percent rotenone, or cube sprays containing 0.02 percent rotenone, were more efficient than a spray containing 1 pound of zinc arsenite to 50 gallons of water. The latter spray is most commonly used by growers of beans in the Grand Junction, Colo., district. The addition of nicotine sulphate (containing 40 percent nicotine), or a diphenyl butyl sodium sulphonate wetter and spreader, to cryolite did not improve its efficiency against the bean beetle. Calcium arsenate with hydrated lime (1-6-50) gave comparatively poor results and barium fluosilicate was ineffective.

Wind Velocity Affects Efficiency of Rotenone Dust Mixtures Against Tobacco Flea Beetle

The effectiveness of rotenone-containing dust mixtures against Epitrix parvula Fab., the tobacco flea beetle, depends greatly on the wind velocity at the time of application, rather than on the time of day when such applications are made. This was demonstrated in a series of tests performed by W. A. Shands and his associates at the Oxford, N. C., laboratory. A series of applications of a dust mixture containing 1 percent rotenone was applied to small field plots at 6 a. m., at noon, and at 6 p. m. Although there was a slight indication that the maximum effectiveness was obtained when the applications were made at 6 p. m., the general conclusion was reached that this time of day coincided with the lowest wind velocity, and it appears that an effective mortality of beetles can be obtained by the proper application of the rotenone-containing dust mixture at any time of the day when the wind velocity does not exceed approximately 4 miles an hour.

Corn Meal Bait More Effective Than Wheat-Bran Bait Against Tobacco Webworm

As a result of recent field experiments at Appomattox, Va., J. U. Gilmore, of the Oxford, N. C., laboratory, reports that a bait consisting of 25 pounds of corn meal, 1 pound of paris green, and 1 ounce of oil of mirbane proved more effective against the corn root webworm, Crambus caliginosellus Clem, on tobacco than a similar bait wherein wheat bran was used as a carrier for the poison and the attractant. In the experiment where corn meal was used as a carrier approximately 2 percent of the plants were killed by webworms, as compared with 5 percent of the plants where wheat bran was used. Approximately 17 percent of the plants were killed by webworms in the untreated check plots.

Calcium Arsenate and Sulphur Mixture Give Best Results in Controlling Strawberry Weevil

W. A. Thomas, of the Chadbourn, N. C., laboratory, reports that in experiments to determine the relative value of various dilutions and combinations of insecticides containing rotenone, pyrethrum, calcium arsenate, and sulphur against the strawberry weevil, Anthonomus signatus Say, the most satisfactory material for reducing the number of weevil-cut buds is a mixture of calcium arsenate and sulphur in the proportion of 1 to 5 by weight. The nonarsenical materials proved to be less effective. Although the plots treated with a dust mixture containing 0.5 percent of rotenone ranked first in production of marketable fruit, there was no significance in the number of weevil-cut buds on any of the treated plots except where the calcium arsenate-sulphur mixture was applied. However, the plots where this mixture was applied showed a corresponding decrease in fruit production, indicating that the difference in yield of marketable berries from the different insecticide treatments may be attributable to visible or invisible plant injury induced by insecticide applications and not to an increased production of cull fruits.

Location of Tomato Fruitworm Eggs on Tomato Plant

J. C. Elmore, of the Alhambra, Calif., laboratory, reports that preliminary cage experiments with adults of the tomato fruitworm, Heliothis obsoleta Fab., have disclosed that nearly 54 percent of the eggs were deposited on the upper surface of the leaves and that 36 percent were deposited on the lower surface. The remaining 10 percent of the eggs were deposited on the stems of the plants, and none of the eggs were deposited on the fruit. If these observations regarding the oviposition habits of the tomato fruitworm moths in confinement are substantiated by field observations, it is believed that advantage may be taken of such oviposition habits in devising control measures for this important pest of tomatoes.

Nicaraguan Locust Bonus

A Managua, Nicaragua, cable to the New York Times says the government, in its warfare against locusts, which destroyed the greater part of the country's cotton, corn, and bean crop, yesterday began paying a bonus of 30 cents for a 5-gallon tin filled with the insects. Nicaragua recently passed a law providing for a package tax on all imported merchandise, the proceeds to be used to combat the locust plague.

Controlling Grasshoppers

Under the direction of Al O'Connell, county agent, and George I. Gilbertson, extension entomologist, two 4-H club boys in Day County have prepared and presented a grasshopper-control demonstration. After presenting the demonstration at a county meeting, their services are in great demand at community meetings. A similar program in other counties would help solve the grasshopper problem. Suggestions may be obtained by writing Mr. Gilbertson at Brookings.

South Dakota 4-H Club Doings,
December 1937. Vol. XI, No. 12

Cottonseed Hulls as Poison Carriers

F. A. Fenton, Oklahoma A. & M. College, author of "Hulls as a Poison Carrier" in American Cotton Grower (August) says in the concluding paragraph: "The value of cottonseed hulls as a carrier for grasshopper poison when used with bran or shorts seems to be definitely demonstrated, and they can be recommended whenever bran is too costly or sawdust cannot be obtained. Hulls are definitely superior to sawdust as a carrier for the poison for armyworms, but more information is needed before recommending them in place of the bran. Last year around 21 tons of hulls were used in Oklahoma for grasshopper bait. It thus appears that in the Cotton Belt a new product is available which may be used in the war on grasshoppers, armyworms, and possibly some other pests."

Toads Protect Sugarcane

William Atherton Dupuy, in Nature Magazine (June), says: "Bufo Marinus is one of the largest toads in the world. It is a native of middle America, but acquired the name of Puerto Rican toad by demonstrating its usefulness to man on that island. It has a ravenous appetite, and its gormandizing proclivities have been harnessed and their money value demonstrated. The toads have been shown to be valuable canefield workers because of their ability to devour great numbers of insects that otherwise would damage the crop. During the present year more than a million of these young toads have been bred at the Experiment Station in Honolulu and distributed to people, mostly growers of sugarcane, who would benefit through their insect voracity .... The toad hatchery for the production of this new article of commerce is in Honolulu, and its output, when the individuals have acquired the proper age, is distributed in tin cans to the plantations... ."

Seek Enemy of Cane Borer

A copyright story from Honolulu, by Science Service, reports that a party from Hawaii is in New Guinea seeking an insect which is the enemy of the sugarcane borer. A scientific exploring party sent out by the Hawaiian Sugar Planters' Association, under the leadership of Cyril E. Pemberton, to seek new types of wild cane, accidentally discovered the new insect ally of sugarcane. Elaborate preparations are being made for the insect's importation. With acclimatizing stations established possibly in Samoa, Fiji, and New Caledonia, the attempt will be made to transplant it to Hawaii. This enemy of the sugarcane borer has no name. (Science Service, January 10-16.)

Wood Tick Paralysis

E. J. Barnett, M. D., author of "Wood Tick Paralysis in Children" in the Journal of the American Medical Association (September 11) says: "Wood tick paralysis in children is acute and progressive but usually afebrile... . In a few hours walking and even standing with support become impossible because of the progressive and increasing muscular weakness... . Prompt removal of the tick, which is easily accomplished, is always followed by rapid improvement, with complete recovery in about 48 hours. Delayed removal is, in most cases, without avail, because fatal respiratory paralysis develops. In adults and larger animals the paralysis is far less likely to be fatal... ."

Insect Pests and Plant Diseases

Special grants of Congress and of the assignment of men from emergency relief rolls have advanced greatly the large-scale campaigns designed to eradicate or control certain plant disease organisms or insect pests, says the annual report of the Bureau of Entomology and Plant Quarantine. These campaigns, while directed at a variety of plant pests, follow the same fundamental methods. Trained scouts determine the area that needs to be covered. Control crews apply suppressive measures to the insect pest or plant disease organism they can find within the area involved. Quarantines may be promulgated and enforced to halt the movement of any material that might carry the pest or disease from the infested or infected territory. None of these campaigns--nor any recommendations for individual control of all the 20,000 insect pests that contest every step of a plant's way from seed to ultimate consumer--would be possible without endless study of insect life cycles and habits, followed by an intensive search for new insecticidal materials and other control measures.

Insects and Diseases

Medical Record (August 18) in an editorial on insects and diseases, says in part: "The fly which conveys sleeping sickness appears to be apreading, according to G. F. M. Swynnerton, who has recently, under the auspices of the English Entomological Society, published a book on the subject... . If left to itself it seems that the fly would depopulate the African tropics of all animal life and that the country would revert to a wilderness. It

must be brought under control, and if possible wiped out... . It is a matter of team work between biologists, foresters, and administrators engaged in experimental research, tribal clearings, and immunization of stock. As far as distribution is concerned the pest is international, consequently the campaign must be international and a beginning has been made... . However, malaria and sleeping sickness and plague are extreme examples of the deadly menace of insects to human life and health. Insects are factors in the causation of disease on a smaller scale and under varying conditions, more so than is realized, and research is called for to determine as clearly as possible what role insects do take in bringing about disease."

Wagons

Ten million dollars worth of horse-drawn vehicles and wheel-barrows were manufactured in the United States last year, says J. E. Kaulfuss, Pennsylvania State College. (Science Service.)

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